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THE RAINFALL OF THE SIX WINTER MONTHS.

October, 1906—March, 1907.

The month of March has been acclaimed in the London press as almost a miracle of fine weather. The warmth and brilliance of every morning in the latter half of the month, outside the fog zone of the metropolis, justified the quotation,

> "Oh what a dawn of day,
> How the March sun feels like May!"

but, taken as a whole, the month was warm and dry only in the south of England and the extreme south of Ireland. Along the south coast from Kent to Cornwall there was less than half the average rainfall, and Torquay was unfortunate enough to record scarcely more than a quarter of the rain it was entitled to expect in a normal month, and on which so much of its climatic advantage depends; but as on former occasions the serious shortage was apparently confined to a small area. In the north-west of England, and in the west of Scotland, March proved somewhat wetter than the average, and in a small area in the north of Ireland the fall was nearly twice the average, Omagh appearing to have been the centre of heaviest rain in the British Isles.

March concludes what may be termed the winter half-year, and a great deal of the comfort of the succeeding summer, especially to the dwellers in large towns, depends upon the rainfall of those months. It is obvious that when growth ceases in autumn, and while temperature is low in winter, and evaporation from the soil is practically suspended, all the water that falls upon the land is free either to run off into the rivers or to soak through the soil and replenish underground water supplies. When the leaves unfold, and grass and all vegetation are in full growth in April, and when the temperature rises and evaporation equals or exceeds the rainfall in summer, it is plain that but little of the falling rain can run the gauntlet of the eager hands on the surface stretched out to catch and absorb it, so that, save in exceptional circumstances, the winter six months alone are effectual in filling wells and reservoirs to be drawn upon in the following summer.

The winter half-year just passed is divided by the turn of the year into three wet months in 1906, and three dry months in 1907, taking the country as a whole; but both halves of the period were wet in the west of Scotland and the north of Ireland. The figures for each month have been published in this Magazine, those for March, 1907, appearing on p. 59. The accompanying Table gives the aggregate rainfall in inches and also as percentages of the thirty years' average for the two periods of three months, and for the whole six months. It shows that the aggregate rainfall of the three months. October—December, 1906, exceeded the average in all parts of Great Britain, except round the coast from the Mersey to the Solway, and in a small area of South Devon. The excess was greater on the eastern than on the western side of the country, but it amounted to 50 per cent. only in a small area in the north Midlands. Ireland had rainfall exceeding the average only in the extreme north, and at one station in the south-west. For these three months the general rainfall of England exceeded the average by 25 per cent., that of Scotland by 15 per cent., while that of Ireland fell short of the average by 5 per cent. Looked at as a whole the general rainfall of the British Isles exceeded the average by 16 per cent.

The first three months of 1907 were remarkably dry in all parts of the country, though we believe not unprecedentedly dry in any case where a long record is available for comparison. The Table shows that in the north-west of Ireland, the west and north of Scotland, and in the east of Norfolk, the rainfall exceeded the average; but in the south of Ireland, and in the south-west of England, from Hampshire to Devon, it was less than half the average; this, for so long a period as three months, being a very unusual circumstance. The general rainfall of England and Wales for these three months, fell short of the average for the first quarter of the year by 33 per cent., that of Scotland by 11 per cent., and that of Ireland by 21 per cent. For the whole of the British Isles, the rainfall of the three months was 25 per cent. less than the average. The deficiency was greater than the excess of the previous three months in England and Wales, and in Scotland; but it must be remembered that the average rainfall of the last three months of the year is considerably greater than the average rainfall of the first three months of the year, in all parts of the country, and thus the state of matters is not so serious as might appear at first sight.

Taking the winter six months into account, as a whole, the Table shows that the whole of the east of England, an area in this instance bounded by a line running from Dungeness to Liverpool, and thence to Berwick-on-Tweed, had distinctly more than the average rainfall, the excess coming to a maximum of over 25 per cent. in Norfolk and considerably exceeding 10 per cent. over the great water-gathering grounds of the Pennine chain. Wales, the Lake District, and the whole south-west of England, had in a corresponding degree a deficiency of rain, amounting to more than 25 per cent. in the east

Rainfall, October, 1906—March, 1907.

STATION.	Oct. —Dec., 1906.	Jan. —Mar., 1907.	Oct., 1906 —Mar., 1907.	Per cent. of Average. Oct. —Dec., 1906.	Jan. —Mar., 1907.	Oct., 1906 —Mar., 1907.
	in.	in.	in.			
London (Camden Square)	9·56	3·05	12·61	129	59	100
Tenterden	12·34	3·30	15·64	129	54	100
West Dean	11·77	2·99	14·76	124	44	91
Hartley Wintney	11·16	3·16	14·32	129	51	96
Hitchin	10·42	3·16	13·58	142	65	111
Winslow (Addington)	10·03	3·21	13·24	129	59	100
Bury St. Edmunds (Westley)	10·81	3·84	14·65	149	79	121
Brundall	11·15	4·88	16·03	143	101	127
Winterbourne Steepleton	14·31	4·89	19·20	108	52	85
Torquay (Cary Green)	9·53	3·92	13·45	85	46	68
Polapit Tamar [Launceston]	14·44	5·85	20·29	106	64	89
Bath	9·78	3·19	12·97	108	49	83
Stroud (Upfield)	10·64	3·35	13·99	124	52	93
Church Stretton (Woolstaston)	11·31	4·75	16·06	160	67	93
Bromsgrove (Stoke Reformatory).	8·42	2·10	10·52	124	43	90
Boston	9·28	3·38	12·66	142	75	115
Worksop (Hodsock Priory)	10·26	3·60	13·86	149	74	118
Derby (Midland Railway)	9·75	4·29	14·04	133	84	113
Bolton (Queen's Park)	17·00	8·65	25·65	133	97	118
Wetherby (Ribston Hall)	10·99	4·81	15·80	145	90	122
Arncliffe Vicarage	23·45	16·29	39·74	124	101	113
Hull (Pearson Park)	10·63	3·78	14·41	132	69	107
Newcastle (Town Moor)	11·81	2·86	14·67	144	51	106
Borrowdale (Seathwaite)	41·47	28·80	70·27	99	78	89
Cardiff (Ely)	14·27	6·28	20·55	106	64	88
Haverfordwest (High Street)	17·87	6·11	23·98	110	52	85
Aberystwyth (Gogerddan)	15·13	8·52	23·65	103	87	96
Llandudno	10·18	4·90	15·08	98	75	89
Cargen [Dumfries]	13·17	9·32	22·49	97	83	91
Colmonell (Clachanton)	17·92	8·50	26·42	122	75	101
Glasgow (Queen's Park)	13·27	8·48	21·75	128	105	118
Tighnabruaich	22·43	15·46	37·89	123	105	115
Mull (Quinish)	19·21	14·17	33·38	101	97	99
Dundee (Eastern Necropolis)	9·20	3·75	12·95	112	61	90
Braemar	14·35	5·69	20·04	129	71	105
Aberdeen (Cranford)	14·73	5·29	20·02	147	74	116
Cawdor (Budgate)	11·22	5·93	17·15	140	96	121
Invergarry	21·26	19·52	40·78	117	119	118
Loch Torridon (Bendamph)	32·23	30·76	62·99	112	140	124
Dunrobin Castle	14·32	9·27	23·59	144	124	135
Killarney (District Asylum)	14·39	7·83	22·22	78	49	64
Waterford (Brook Lodge)	10·55	3·75	14·30	86	38	65
Broadford (Hurdlestown)	10·30	6·39	16·69	106	87	98
Abbey Leix (Blandsfort)	9·44	5·15	14·59	93	64	80
Dublin (FitzWilliam Square)	6·69	3·66	10·35	83	61	74
Ballinasloe	9·31	7·53	16·84	87	89	88
Clifden (Kylemore House)	20·94	13·05	33·99	83	66	76
Crossmolina (Enniscoe)	15·58	12·07	27·65	95	93	94
Seaforde	11·51	6·45	17·96	101	70	87
Londonderry (Creggan Reservoir).	14·89	12·82	27·71	115	137	124
Omagh (Edenfel)	12·79	9·89	22·68	116	119	117

of South Devon, and approaching 10 per cent. over the great water-gathering grounds of Wales. It would thus appear more likely that shortage of water would occur in the course of the coming summer in the large towns supplied from Wales and the Lake District, than in those supplied from the Pennine chain, if other things were equal. As a matter of fact, however, the Welsh supplies being of more recent origin have probably a larger margin of reserve to draw upon, and unless there is an unusually hot and dry summer, shortage of water is more likely to be felt in the south and south-west of England, than in other localities.

For England and Wales as a whole the general rainfall of the six months was exactly the average; for Scotland it showed an excess of only 4 per cent., while in Ireland, where both periods had been dry, there was a deficiency of 12 per cent., the deficiency being greatest in the south, where it was more than 25 per cent., and disappearing in the extreme north, where there was on the other hand an excess of more than 20 per cent. The six months for the whole of the British Isles showed a deficiency of rainfall amounting to 2 per cent.; so that, speaking generally, the total amount of water deposited on our islands in the winter six months of 1906–07 did not differ appreciably from the average amount of the last thirty years, though there were peculiarities of distribution both in space and time. The detailed Table may for convenient reference be summarised as follows:—

General Rainfall for the Winter six months, 1906–07, as percentage of average.

	England and Wales.	Scotland.	Ireland.	British Isles.
Oct.–Dec., 1906.....	125	115	95	116
Jan.–Mar., 1907	67	89	79	75
Oct., 1906–Jan., 1907 ...	100	104	88	98

REMARKS ON A WATERSPOUT AND ACCOMPANYING PHENOMENA, ENCOUNTERED IN THE EUXINE.

By Reginald Page.

On the 14th July, 1906, the British steamer *Dalyarth* left the port of Novorossisk, laden with a cargo of oil-cake for the Baltic. During the spell in harbour the weather had been very hot, with a larger amount of rain than usual. On the 15th, when about 100 miles from Novorossisk on her course towards the Bosphorus, the officer of the watch observed heavy waterspouts to the northward about 8 a.m. There appeared three funnel-like spouts, separated in the columnar portions, but in the cone or upper part all uniting in a heavy mass of nimbus; the sky was mostly clear, a few low-lying cirro cumulus cloud-banks and bright, clear sunshine. The vessel, now steaming full speed, soon dropped these out of sight.

On the evening of that day the sun set behind heavy cloud-banks, and after the twilight had died away the heavens were aflame with incessant lightning. At 10 p.m. the captain was called as the vessel was abreast of Kilia Point Light—the light, however, being obscured by heavy rain clouds—and the engines were then slowed down in order that the steamer should not arrive at the Bosphorus before daylight; no vessels are allowed to enter Ottoman waters between sunset and sunrise. At midnight the scene was most impressive: sky clouded in, and over the land the lightning revealed the columns of four waterspouts, or one waterspout having four columns, each of which appeared to reach the water; the lightning was now incessant and vivid, and appeared to be confined to the vicinity of the waterspout, enabling the latter to be plainly discerned; the columns appeared to be quite black, but the spaces in between them showed up with a coppery hue; over the top an impenetrable cloud of black nimbus joined the four columns in one. The spouts were growing in magnitude and apparently moving directly towards the steamer accordingly she was headed west and the engines were put full speed ahead in order to allow the waterspout to pass astern of the steamer,

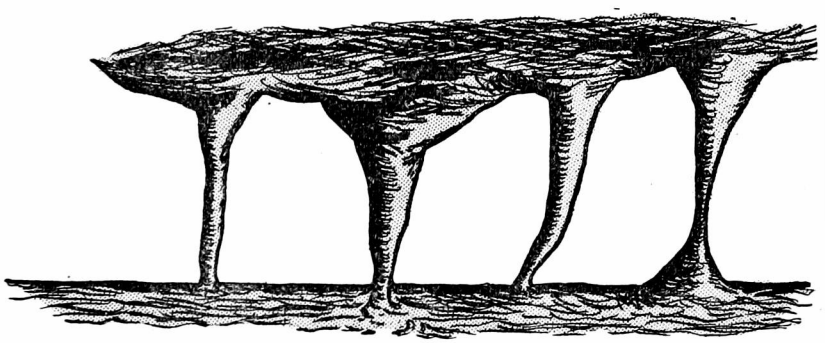

Fig 1.

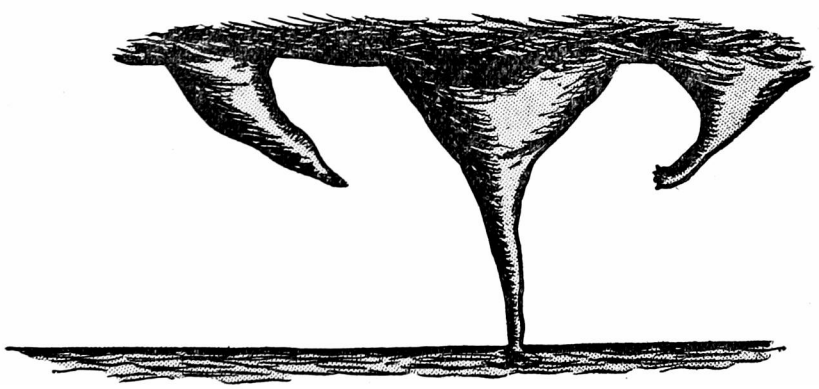

Fig.2.

About 1 a.m., as the waterspout appeared to be approaching, the course was altered to the north, thus bringing the waterspout astern; it is curious to note that though the steamer was proceeding west at her full speed the position of the waterspout in relation to the steamer remained unchanged. During this time there was no wind, yet the progress of the waterspout must have been about 15 miles per hour; as the vessel proceeded north the spout still gained, and about 2 a.m. the centre of the disturbance passed alongside and to the east of the steamer, at a distance of perhaps half-a-mile. There was a sound of broken water, resembling distant surf on a beach; a terrific deluge of rain, which obscured all view of the waterspout—even the lightning failed to penetrate through the downpouring sheets of water. The falling water was fresh.

About 3 a.m. the rain ceased and the waterspout was visible to the north-east, having now only one column reaching to the water, and two smaller columns, each of which was bending towards the rain column and no longer reaching the sea. The spout was finally lost to view amid a black mass of nimbus as day dawned. Dead fish were lying on the surface of the water, and some had even fallen on the deck of the steamer. During the passage of the waterspout the sea was considerably disturbed, the vessel rolling slightly to the swell caused by it.

SCOTTISH METEOROLOGICAL SOCIETY.

THE Half-yearly General Meeting of this Society was held on the afternoon of March 19th, at 5, St. Andrew Square, Edinburgh, Professor Crum Brown in the chair.

The following report from the Council was read:—

There has been no change in the Society's Stations since the Meeting in July.

The following Stations have been inspected since July by Mr. Watt:—Aberdeen, Balmoral, Peterhead, Glasgow (Belvedere Hospital), Leadhills, and Dumfries.

It is at this Meeting that the annual election of Office-Bearers takes place. The Members of Council who retire by rotation are Professor J. G. M'Kendrick, Sir James Marwick, and the Hon. John Abercromby. The Council recommend the re-election of the Hon. John Abercromby, and the election of Sir Archibald Buchan-Hepburn, Bart., of Smeaton, and Mr. Henry Coates, F.R.S.E., in place of the other two gentlemen.

The Registrar-General for Scotland has been regularly supplied with the Monthly and Quarterly Reports from the Office of the Society, and also, direct from the Observers in the eight large towns of Scotland, with the Daily Observations of Temperature and Rainfall required for his Weekly Reports.

The Meteorological Office in London has received direct from the Observers at Lairg, Glencarron, Balmoral, Fort Augustus, Fort William, Clathick, Marchmont, Dumfries, and Cally, Daily Observations of Tem-

perature, Rainfall, and, in some cases, Sunshine, for their Weekly Weather Reports.

Meteorological Statistics have been sent as usual to several Medical Officers of Health in various parts of Scotland for their Annual Reports.

The Council have appointed Mr. Andrew Watt, M.A., F.R.S.E., Assistant Meteorological Secretary. The Council have also agreed that Mr. Watt should occasionally deliver Lectures, under the auspices of the Society, on subjects of popular interest connected with Meteorology.

The Council have much pleasure in announcing the receipt of a donation of £100 from the Hon. John Abercromby.

Dr. Buchan's time has been very largely devoted to the carrying on of the general discussion of the Ben Nevis records. In connection with this discussion he has investigated the occurrence of Thunder and Lightning in Scotland, and a Paper on this subject will be communicated to the Meeting to-day.

Dr. Buchan communicated a paper on "Thunderstorms in Scotland," in the preparation of which he had been assisted by Mr. Herbert Bell, M.A., B.Sc. The weather journals of the keepers of the Scottish lighthouses had been analysed for the 21-year period, 1884-1904, and the annual and diurnal periods of thunderstorms, of thunder alone, and of lightning as an independent phenomenon, were discussed. It was pointed out that whilst thunderstorms had a maximum frequency about 5 p.m., thunder alone appeared to have a maximum earlier by some two hours; the morning hours of minimum frequency differed in the same way. In the case of the Ben Nevis records there was a similar difference of phase, but lightning alone, as observed from the high-level station, had a very distinct midnight maximum, as was the case over the ocean, whilst at lower levels the greatest frequency was some hours earlier. As had already been shown in the case of rainfall, there was a well-marked 11-year period in the occurrence of thunderstorms in Scotland; at least, that was the case for the time under discussion, during which thunderstorms were unusually frequent about 1884 and 1895. It was of great interest to note that this periodicity was in entire agreement with that shown by Steen to exist for Scandinavia and Denmark, the sympathy with Denmark being extremely close.

A paper by Mr. R. T. Omond on "Variations in Mean Monthly Temperatures at Edinburgh," was based on the statistics of R. C. Mossman's memoir on the climate of Edinburgh, and dealt with the 100-year period, 1801-1900.

(1). Comparing the average temperature of each month with the 100-year normal for the month, it was at once apparent that the range of difference was much greater in winter than in summer. Thus, for January and July we had:—

	JANUARY.		JULY.
Normal	37°·1	.....	58°·5
Highest	44·6 in 1898	.....	64·0 in 1852
Lowest	26·5 ,, 1814	.....	54·4 ,, 1879
Range	18·1	.....	9·6

(2). Considering the average departures from the normal, a similar contrast was found between summer and winter. Thus, the average departure for the three winter months was 2°·5, whilst for the summer period, June—August, it was hardly 1°·5. The causes of these contrasts between the extreme seasons were discussed.

(3). The most frequently occurring temperature for each month was considered, and it was found that the "Scheitelwerth," or Median Value, was in winter about 2° *above* the normal, and in summer about 1° *below*. In spring and autumn there was a fair agreement between the normal and the most frequent value, and these results were in accordance with what had been found for some other places in Europe. In winter a large number of cases with a + departure were balanced by a smaller number of cases with a large — departure, and the opposite held good in summer. The explanation was pointed out: Our skies might be said to be normally cloudy, but when a period of comparatively clear sky did occur, then in winter terrestrial radiation was active at night with low temperatures. In summer, on the other hand, during a clear period, solar radiation was very effective, and the air had not time to cool down much during the short night. In spring and autumn, however, a clear sky both raised the day temperature and lowered that of the night, leaving the monthly mean but little affected.

Discussion followed the reading of both papers, and the authors were thanked for their contributions.

ROYAL METEOROLOGICAL SOCIETY.

THE March meeting of this Society is always the popular night of the session, and Wednesday evening, the 20th ult., was no exception to the rule. The large hall of the Institution of Civil Engineers was crowded with Fellows and their friends, who had gathered together to hear Major B. Baden-Powell deliver a lecture on "The Exploration of the Air."

The President, Dr. H. R. Mill, said that during the last few years special attention had been directed to the study of the free atmosphere at heights far above the ground. Previously the study of meteorology was scarcely concerned with anything but the phenomena at the Earth's surface, and meteorologists only felt competent to deal with those layers of the air immediately around them. They were now beginning to rise in the air, if not in the world, and were looking eagerly at regions of the atmosphere which formerly lay entirely beyond their reach. Efforts had been made by the Royal Meteorological Society to encourage the renewal of research by means of kites and balloons, and Mr. Dines, who had done so much in this way, had on more than one occasion described his work to them. That evening they were to have the pleasure of having a lecture from one of the pioneers in the use of kites, and some of

the lantern slides which the lecturer would show, would be something of a revelation to most of them.

Major B. F. S. Baden-Powell began his lecture by saying that the atmosphere forms a vast ocean above us—an ocean but little explored. We crawl about the ground like crabs on the bottom of the sea. We make our meteorological observations down on the ground, ignorant of all that is going on in the midst of that great expanse of air above our heads where the clouds hang about; where the rain and the hail are formed; where the lightning flashes have their origin. We look to the cross of St. Paul's, or the top of the Eiffel Tower, as the most exalted of points at which to observe the mechanism of the atmosphere; yet these compare to the aerial ocean but as a pin stuck in the carpet does to the air of a room. If all the clouds in the sky were suddenly solidified in their various shapes and different elevations, what vast realms of unexplored territory there would be. But even though not solid land, there is still plenty to explore in these regions of ever-changing cloudland. If we can mount up among them, we can ascertain the temperature, the humidity, the air pressures, the electrical effects, and many other points on which we are at present very ignorant.

Major Baden-Powell stated that there are two classes of people interested in the exploration of the atmosphere: (1) The meteorologists, who study it chiefly to find out about the weather; and (2) the inventors, who would utilise it as a highway of travel. But these two are by no means rivals. The attainment of their objects will be of mutual assistance to one another. The aerial navigator will want to know all about the currents and the conditions of the air, while the meteorologist will derive the utmost benefit from the ability to visit any parts of the atmosphere. There are three means now at the service of man by which he may ascend into these desirable regions, or may send up self-recording instruments to probe the mysteries of the skies—viz., balloons, kites and flying machines. Although at the time of its invention the balloon was hailed with acclamation as promising the conquest of the air to man, yet it is now realised that this cumbrous and delicate apparatus is not capable of much practical application. It is, nevertheless, useful (1) as an observatory for scientific investigation; (2) as a means of reconnaisance in war; and (3) as a most agreeable way of spending an hour or two in blissful peace and sublimity. But recently great strides have been made in the improvement of the balloon in the way of providing it with engines and propellers, so that it may be driven to any predetermined goal. Twenty-five years ago the French Government made the first dirigible airship, and now they possess one, if not more, that seems to be a really practical air vessel of war. Count Zeppelin, in Germany, has also produced a machine which in point of size, as well as in speed, has beaten all records. Going to the other extreme, we have small balloons now capable of attaining the greatest heights, carrying self-recording instruments.

Such contrivances have recently ascended to the enormous altitude of 82,000 feet, or nearly 16 miles above the surface of the Earth. Closely connected with this subject of *ballons sondes*, as the French call them, is that of meteorological kites. These also have been much improved in recent years, and instruments lifted by kites retained by steel wires have actually ascended to a height of four miles. Kites of a much larger dimension have also come into use during the last few years. At Aldershot they have been regularly introduced into the service. Men were first lifted by this means in 1895, in which year the lecturer made a number of ascents up to 100 feet high, but improvements have gradually followed until now men have actually gone up to a height of 3000 feet, an elevation practically beyond the reach of rifle bullets, and so high as to render the aeronaut almost invisible.

Major Baden-Powell, in conclusion, referred to a subject which, if it had not hitherto had any very practical results, yet promises to bring about perhaps the most extraordinary changes in the life of man that have resulted from any of the marvellous inventions of the 19th or 20th centuries. The flying machine has come, and it has come to stay. Years ago people argued that it was impossible to lift in the air that which was far heavier than the air. But the advocates of the cause pointed to the birds, and there was no gainsaying that the thing was possible. Then the pessimists cried that it would not be possible to balance the apparatus without the intelligence of the bird, but models were made, finally so good as to fly for three-quarters of a mile. Then men took to gliding on wings and sailing on the wind. Huge machines were constructed with very light engines, and finally, during the last two or three years, not only have men been successfully raised off the ground, but have been able to sustain themselves in the air for half-an-hour at a time. Very little more now remains to be done before we can say that man has veritably conquered the air.

The lecture was illustrated by lantern slides and models.

The following gentlemen were elected Fellows of the Society :— Major B. F. S. Baden-Powell, Señor D. Bebianno, Mr. R. T. G. Cross, Mr. B. J. Donnellan, Mr. G. A. Green, Mr. H. W. Hipwell, Major J. Bruce Kingsmill, Mr. E. L. Mansergh, M.Inst.C.E., Mr. W. L. Mansergh, Assoc. M.Inst.C.E., and Pandit G. M. Vidyabhusan.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

SUNSHINE RECORDERS.

I HAVE read with much interest Mr. Edward Kitto's remarks on sunshine recorders on page 13 of the February Magazine.

With reference to the "objection to the Jordan recorder" alluded to, perhaps I may be allowed a word of explanation, as it seems to

me that any "want of uniformity in the sensitiveness of the paper employed" is not so important a matter as would at first appear, seeing that the only purpose of the instrument is to record the duration of bright sunshine, and not the varying intensity of the sun's rays. In the latter case, a perfect uniformity of sensitiveness would necessarily be all-important.

However sensitive the paper may be, the construction of the instrument precludes the possibility of its registering too much sunshine, for, unless the sun's rays are bright enough to cast a distinct image of the aperture through which they shine on the surface of the sensitized chart, there will be no impression or trace produced. On the other hand, if the photographic chart is sufficiently sensitive to register the image, however faint it is, a trace of the bright sunshine will be secured, and the purpose of the instrument would seem to be attained.

An excess of the sensitiveness will merely exhibit a more deeply coloured trace, without in any way augmenting its apparent duration.

JAMES B. JORDAN.

"*Hayfield*," *Hythe, Kent, March 5th, 1907.*

RAPID FORMATION OF FOG AND GLOOM.

DURING the afternoon of February 28th, at 2.45 p.m., I was coming across Epsom Downs; it had been, and was then, a brilliantly fine and warm day, with continuous sunshine and a cloudless blue sky. An exceptional degree of visibility also prevailed—the tower on the top of Leith Hill standing out with marked clearness. At 3 p.m., when I reached the highest ridge of the Downs (about 470 feet), which commands a view in all directions, there was no apparent change in the conditions, save for a well-defined fog-bank which appeared to extend from N. to N.E., and upwards towards the zenith. A few seconds' observation showed that this bank was approaching very rapidly, and extending laterally. It reached the zenith at 3.2 p.m., and by 3.5 p.m. the landscape had been entirely blotted out, objects 10 feet distant being quite invisible; the bright sunshine had given place to a sun of a vivid crimson hue. Very well-marked fog-billows were visible; they moved with a wave-like motion from N.E. to S.W., at a height of about six feet, light grey in colour and very damp. They were accompanied by a current of cold air. Overhead there was a thick gloom of a brownish hue. A very appreciable cooling of the atmosphere took place, with a great accession of moisture. The wind at 3 p.m. was S.E., force 1, veering at 3–5 p.m. through E. to E.N.E., force 2. The retreat of the phenomenon was very nearly as rapid as its approach; dense fog and gloom prevailed at 3.40 p.m., and at 3.45 p.m. this had given place to practically the same conditions as at 3 p.m. The outline of the fog-bank was again visible in a S. to S.W. direction.

The phenomenon appears to have been confined only to the high ground, as at this station (160 feet) nothing more than the passage of a high fog was noticed at 3 p.m.; this was of short duration, and was accompanied by a temporary and very slight obscuration of sunshine. The thermograph trace shows a rapid drop in temperature of 8° in a few minutes at 3 p.m., 53° to 45°, and a recovery to 48° at 3.15 p.m.

SPENCER C. RUSSELL, F.R.Met.Soc.

Epsom, March 2nd, 1907.

PROTRACTED DROUGHT IN MID-WESSEX.

MARCH, 1907, has been in these parts the driest of four consecutive dry months.

I gather from about thirty returns of rainfall over the region which lies between Shaftesbury and Langport, E. and W., and Shepton Mallet and Beaminster, N. and S., that the rainfall for the first quarter of 1907 is only about 40 per cent. of the average. At many of our stations the whole fall of the three months is less than half of the fall in January, 1906. Not one of the stations reports any other year so dry in its first quarter, and those years, viz., 1898 and 1902, which came nearest to this, though *longo intervallo*, were preceded by *very* wet Decembers; whereas last December was the driest but one for probably 14 years.

At North Cadbury the four months just ended gave a total of 4·40 in., as against an average of 11·11 in. for the same months in the previous ten winters, and a previous lowest, viz., in 1904-5, of 8·56 in.

The warmth of the days, and the sunniness of March, were quite unusual; and on comparing my figures now taken here with those recorded by me at Patras, on the shore of the west coast of Greece, in lat. 38° N., in March, 1874, I find a result so extraordinary that it should be put on record:—

	North Cadbury. March, 1907.		Patras, Greece. March, 1874.	1873.
Highest Maximum in Shade ...	71°·0	.....	61°·1	82°·0
Average ,, ,, ,, ...	55·9	.....	52·8	65·7
Lowest ,, ,, ,, ...	45·0	.....	40·0	60·2

That March in Greece was truly of unprecedented severity, but it, too, was fairly dry and sunny, and I should not have expected the warmest March in England so far to have surpassed it in day warmth.

March, 1873, at Patras was as unusually hot, so I add the figures for that year also (vide *Quarterly Journal* of the Royal Meteorological Society for July, 1875, and July, 1877).

H. A. BOYS, F.R.Met.S.

North Cadbury Rectory, April 4th, 1907.

JAPANESE METEOROLOGICAL OBSERVATIONS IN CHINA AND KOREA.

By L. C. W. Bonacina.

During 1904 and 1905 an extensive system of meteorological observations in China and Korea was established by the Japanese Government, and the results have appeared in a number of pamphlets published by the Central Meteorological Observatory at Tokio.

The contents of these pamphlets, which include an English translation of the Japanese text, consist of masses of tables relating to the various meteorological elements upon which the observations were made at ten stations in China, five in Korea, and one in Yezo. The instruments and method of observation accord with those in use at all meteorological stations in Japan, and the time adopted is the Central Standard, or the mean time of the meridian of 135° E. The barometric and vapour-tension readings as well as the rainfall measurements are given in millimetres, the velocities of the wind are expressed in metres per second, and the degrees of temperature are on the Centigrade scale. The record for 1904 is very fragmentary, but that for 1905 is much better, and is complete for nine out of the sixteen stations.

The Table which follows gives a few interesting figures as obtained from the nine complete records in 1905. It will be noticed that the range of temperature between the absolute extremes for the year was in every case very large, which accords well with what we already know concerning the severity of the seasons in China. That a temperature of 21°·9 F. should have occurred at Hangchow in latitude 30° N. and on the Pacific sea-board, certainly calls for remark. At Fusan, in Korea, the extremes were of the same order that occurs in the inland parts of England during an average year, viz., 90° F. and 15° F. The number of thunderstorm days at the several places was on the whole considerably greater than is usually experienced in England, but the number of snowy days, or days with snow, was about the same as occurs scattered through the late autumn, winter and spring in an average year at places in the lower-lying parts of England, viz., from ten to thirty. The high rainfall at Hangchow and Nankin should be noted, for, as these places are situated in the plain of Western China, it is probably associated with the low latitude of the places and their proximity to the Pacific.

It is sincerely to be hoped that the system of observations here discussed will prove to be the commencement of a long and valuable series which will enable a comparison to be instituted between the variability of the seasons from year to year in Eastern Asia with the variability in Western Europe, where it is so very pronounced a feature of the climate.

Summary of Meteorological Observations in Korea and China, 1905.

STATION.	Latitude N.	Longtitude E.	Temperature, F. abs.max.; abs.min.	Total Rainfall in inches.	No. of days with Thunder-storms.	No. of days with Snow.
In KOREA:—						
Chemulpo	37° 29′	126° 37′	90°7 ; 8°4	54·72	16	21
Yongampo	39 56	124 22	88·0 ; 1·4	45·68	12	13
Wonsan	39 9	127 26	94·8 ; 2·1	73·33	7	27
Fusan	35 6	129 3	89·8 ; 15·0	80·60	19	5
In CHINA:—						
Nanking	32 5	118 49	100·4 ; 21·2	49·77	27	16
Hangchow	30 11	120 12	103·3 ; 21·9	75·64	37	18
Yinkow	40 40	122 14	90·9 ; -5·8	24·88	17	17
Tiensin	39 10	117 10	104·7 ; 9·3	19·74	25	6
Tairen	38 56	121 36	90·0 ; 3·0	21·55	18	15

REVIEWS.

Climatology of the United States. By ALFRED JUDSON HENRY, Professor of Meteorology. Prepared under direction of WILLIS L. MOORE, Chief U.S. Weather Bureau. Washington, 1906. Size $11\frac{1}{2} \times 9\frac{1}{2}$. Pp. 1012. Price $10.

THIS massive volume deals with the climatology of the United States, on the basis of observations mainly made between 1870 and 1903, including the whole period of activity of the national meteorological organization under the Signal Service and the Weather Bureau up to date.

The first chapter deals with the broad features of the climate of the United States in 112 pages, supplemented by a large number of maps illustrating normal and extreme distributions of the climatic elements, and also various typical instances of weather. Then follows a section on the climatology of each of the following regions: New England and Middle Atlantic States, South Atlantic and East Gulf States, the West Gulf and southern Rocky Mountain slope, the North Central States, the Rocky Mountain and Plateau region, and the Pacific slope. After a brief introduction, the stations in each state are dealt with consecutively, a page being devoted to each containing the means and extremes of monthly, seasonal and annual temperature and precipitation for the period during which the observations extended. In some cases humidity, wind-direction and sunshine are added. The actual figures for individual months and years are not given, and so far as we have read we have not observed any attempt to show the relation of the means of short periods to long averages or normal values.

Die tüglichle Gang der Temperatur in der äusseren Tropenzonen. A. Das Amerikanische und Afrikanische Tropengebiet. [The daily march of temperature in the outer tropical zones. A. The American and African tropical districts.] Von JULIUS HANN. Wein, 1907. Size $12\frac{1}{2} \times 9\frac{1}{2}$. Pp. 88.

DR. HANN had previously dealt with the conditions of daily temperature in the equatorial part of the tropical zone—to 15° N. and S.—and he here extends the "laborious and thankless labour" of compiling the scattered and unequal data for the outer portions of the zone as far as the northern and southern tropics. The collection of all available data which is contained in this memoir must prove of the utmost utility to the student of the wider problems of world meteorology, all the tables being arranged on the same plan and reduced in every instance to the centigrade scale.

Grundzüge einer Theorie der synoptischen Luftdruckveränderungen [Basis of a theory of synoptical pressure changes]. Von DR. FELIX M. EXNER. Wien, 1906. Size $10 \times 6\frac{1}{2}$. Pp. 76.

A MATHEMATICAL discussion of the movements of isobaric forms, based largely upon the work of the U.S. Weather Bureau.

METEOROLOGICAL NEWS AND NOTES.

DR. SHAW'S COURSE OF LECTURES on Dynamical Meteorology at University College, Gower Street, will be resumed on Monday, 29th April, at 5 p.m., and continued on Fridays and Mondays until May 17th, when the last lecture of the course will be delivered.

"BALLOONING AND AERONAUTICS" is the title of a new illustrated monthly magazine, published at one shilling net, by Messrs. Guide and Co. It deals in a comprehensive and interesting way with matters which are so far on the borders of meteorology that all experiments to improve aeronautics at present involve knowledge of weather conditions, while in the future perfected methods of movement through the air may be expected to promote the scientific study of the conditions of the upper atmosphere.

CORRECTIONS.—In Mr. Clark's paper on "A relation between Rainfall at York and Solar Cycles," on p. 32 of last month's issue, the last two lines of the third paragraph and the first line of the fourth paragraph should read as follows:—

September were 30·53 in. and 45·19 in; for October 35·62 in. and 49·61 in. Again, for August and October the contrast is true of *each* cycle.

In Mr. Gaw's article on "Atmospheric phenomena during the Chile Earthquake," in the January number (Vol. **41**, p. 226), the word "minutes" in the seventh line from the bottom of p. 227 should be "seconds," and the line should read:—

8 h. 7 m. 30 s. with 20 seconds' duration. The latter shock was the

TEMPERATURE FOR MARCH, 1907.

STATION.	COUNTY	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	TEMPERATURE. Max. °	Max. Date.	Min. °	Min. Date.	No. of Nights at or below 32° Shade.	Grass.
Camden Square	*London*	51 32	0 8	111	68·7	31	24·4	12	9	20
Tenterden	*Kent*	51 4	*0 41	190	69·4	31	25·0	12	9	24
West Dean	*Hampshire*	51 3	1 38	137	66·0	28†	19·0	12	19	22
Hartley Wintney	,,	51 18	0 53	222	69·0	30	21·0	12	19	23
Hitchin	*Hertfordshire*	51 57	0 17	238	70·0	31	22·0	12	13	...
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	69·0	30, 31	22·0	12	16	22
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	70·0	31	25·0	5	16	...
Brundall	*Norfolk*	52 37	*1 26	66	70·0	30	26·8	5	9	22
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	62·8	31	20·0	12	18	19
Torquay (Cary Green)	*Devon*	50 28	3 32	12	59·0	30	30·9	12	2	17
Polapit Tamar [Launceston]	,,	50 40	4 22	315	64·6	28	24·7	5	13	19
Bath	*Somerset*	51 23	2 21	67	67·0	28	24·8	5	16	...
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	63·0	30, 31	28·0	11	...	...
Church Stretton (Woolstaston)	*Shropshire*	52 35	2 48	800	64·5	28, 30	18·5	4	22	...
Bromsgrove (Stoke Reformatory)	*Worcestershire*	52 19	2 4	225	65·0	27, 31	20·0	11	19	...
Boston	*Lincolnshire*	52 58	0 1	25	68·0	30	25·0	12	11	...
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	68·3	31	24·4	12	15	24
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	69·0	31	24·0	11	16	...
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	66·3	31	28·5	24	5	18
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	...	...	...	...	...	...
Arncliffe Vicarage	,, ,,	54 8	2 6	732	...	...	...	...	...	...
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	69·0	30	28·0	12	10	20
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	...	...	...	...	...	...
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	63·3	26	28·1	12	7	...
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	...	...	...	...	...	...
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	62·1	26	27·2	24	6	16
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	70·0	31	23·0	5	...	...
Llandudno	*Carnarvon*	53 20	3 50	72	66·5	29	32·5	12	...	...
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	62·0	29	25·0	12	8	...
Lilliesleaf (Riddell House)	*Roxburgh*	55 31	2 46	550	...	..	...	...	...	...
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	64·0	29	27·7	10	5	10
Colmonell (Clachanton)	*Ayr*	55 8	4 54	140	61·0	29	23·0	13	...	...
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	63·0	29	28·0	8, 9	7	19
Tighnabruaich	*Argyll*	55 55	5 14	50	50·0	27‡	26·0	8	13	13
Mull (Quinish)	,,	56 36	6 13	35	64·0	31	...	...	...	...
Dundee (Eastern Necropolis)	*Forfar* ..	56 28	2 57	199	61·2	27, 28	23·4	12	9	...
Braemar	*Aberdeen*	57 0	3 24	1114	...	...	...	...	...	...
Aberdeen (Cranford)	,,	57 8	2 7	120	64·0	27	16·0	11	13	...
Cawdor (Budgate)	*Nairn*	57 31	3 57	250	...	...	...	...	...	...
Invergarry	*E. Inverness*	57 4	4 47	130?	...	...	...	...	...	...
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	...	...	...	...	...	...
Dunrobin Castle	*Sutherland*	57 59	3 56	14	59·0	27	25·0	12	9	...
Castletown	*Caithness*	58 35	3 23	100	61·0	27, 29	18·0	11	15	16
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	64·5	28	38·0	22	...	...
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	59·0	27	28·0	23	3	...
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	56·0	27, 29	28·0	6	3	...
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	60·0	27	29·0	1, 23	...	10
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	64·1	27	31·8	31	1	9
Ballinasloe	*Galway*	53 20	8 15	160	67·5	27, 28	22·0	23	12	...
Clifden (Kylemore House)	,,	53 32	9 52	105	...	...	...	...	...	...
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	...	...	...	...	...	...
Seaforde	*Down*	54 19	5 50	180	57·0	25	30·0	5	5	18
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	...	...	...	...	...	...
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	59·0	27	28·0	22	...	...

† and 30, 31, ‡ and 29, 31.

RAINFALL FOR MARCH, 1907.

RAINFALL OF MONTH.							RAINFALL FROM JAN. 1.					
Aver. 1870-99. in.	1907. in.	Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1870-99. in.	1907. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1870-1899. in.	STATION.
1·62	·97	— ·65	60	·23	12	13	5·13	3·05	— 2·08	59	25·16	Camden Square
1·89	·88	—1·01	47	·14	5	12	6·10	3·30	— 2·80	54	28·36	Tenterden
1·79	·54	—1·25	30	·19	16	10	6·74	2·99	— 3·75	44	29·93	West Dean
1·77	1·00	— ·77	56	·19	16	12	6·22	3·16	— 3·06	51	27·10	Hartley Wintney
1·53	·97	— ·56	63	·21	13	12	4·88	3·16	— 1·72	65	24·66	Hitchin
1·62	1·14	— ·48	70	·19	12	13	5·40	3·21	— 2·19	59	26·75	Addington
1·64	1·02	— ·62	62	·31	19	9	4·89	3·84	— 1·05	79	25·39	Westley
1·65	1·39	— ·26	84	·35	9	14	4·81	4·88	+ ·07	101	25·40	Brundall
2·41	1·01	—1·40	42	·26	16	12	9·42	4·89	— 4·53	52	39·00	Winterbourne Stpltn
2·45	·66	—1·79	27	·33	16	7	8·51	3·92	— 4·59	46	35·00	Torquay
2·41	1·41	—1·00	58	·46	16	15	9·12	5·85	— 3·27	64	38·85	Polapit Tamar
1·94	·70	—1·24	36	·17	16	12	6·58	3·19	— 3·39	49	30·75	Bath
1·86	·69	—1·17	37	·12	16†	13	6·45	3·35	— 3·10	52	29·85	Stroud
2·01	1·34	— ·67	67	·21	19	15	7·09	4·75	— 2·34	67	33·04	Woolstaston
1·36	·63	— ·73	46	·15	9	9	4·90	2·10	— 2·80	43	24·50	Bromsgrove
1·36	1·46	+ ·10	107	·45	19	10	4·50	3·38	— 1·12	75	23·30	Boston
1·55	1·38	— ·17	89	·55	19	16	4·87	3·60	— 1·27	74	24·70	Hodsock Priory
1·49	1·38	— ·11	93	·51	19	13	5·10	4·29	— ·81	84	26·18	Derby
2·88	3·87	+ ·99	134	·99	9	16	8·93	8·65	— ·28	97	42·43	Bolton
1·85	1·71	— ·14	92	·44	19	11	5·37	4·81	— ·56	90	26·96	Ribston Hall
5·03	7·25	+2·22	144	1·53	16	16	16·10	16·29	+ ·19	101	60·96	Arncliffe Vic.
1·79	1·23	— ·56	69	·34	19	14	5·45	3·78	— 1·67	69	27·02	Hull
2·10	1·13	— ·97	54	·41	9	13	5·64	2·86	— 2·78	51	27·99	Newcastle
10·51	14·10	+3·59	134	4·25	16	17	36·86	28·80	— 8·06	78	132·68	Seathwaite
2·79	1·71	—1·08	61	·50	15	13	9·77	6·28	— 3·49	64	42·81	Cardiff
3·03	1·53	—1·50	50	·35	16	14	11·86	6·11	— 5·75	52	47·88	Haverfordwest
2·93	2·56	— ·37	87	·55	6	16	9·83	8·52	— 1·31	87	45·41	Gogerddan
1·97	1·93	— ·04	98	·55	9	13	6·51	4·90	— 1·61	75	30·98	Llandudno
3.01	4·33	+1·32	144	1·22	16	13	11·17	9·32	— 1·85	83	43·43	Cargen
2·40	...	...	...	...	...	...	7·41	...	...	...	33·04	Riddell House
...	1·83	...	...	·65	16	11	...	3·68	...	...	...	Edinburgh
3·18	3·40	+ ·22	107	·83	16	17	11·37	8·50	— 2·87	75	44·85	Colmonell
2·33	3·94	+1·61	169	1·05	16	16	8·11	8·48	+ ·37	105	35·80	Glasgow
4·36	6·72	+2·36	154	1·05	16	22	14·79	15·46	+ ·67	105	57·90	Tighnabruaich
4·23	5·06	+ ·83	120	·53	4	25	14·58	14·17	— ·41	97	57·53	Quinish
1·92	1·80	— ·12	94	·90	16	13	6·12	3·75	— 2·37	61	28·95	Dundee
2·42	1·72	— ·70	71	...	...	...	8·03	5·69	— 2·34	71	36·07	Braemar
2·43	1·53	— ·90	63	·52	16	16	7·18	5·29	— 1·89	74	33·01	Aberdeen
2·16	2·20	+ ·04	102	·47	7	14	6·16	5 93	— ·23	96	29·37	Cawdor
4·83	6·09	+1·26	126	1·21	14	20	16·35	19·52	+ 3·17	119	56·00	Invergarry
6·38	9·47	+3·09	148	1·80	4, 14	21	21·90	30·88	+ 8·98	141	86·50	Bendamph
2·47	1·99	— ·48	81	·26	17	15	7·48	9·27	+ 1·79	124	31·60	Dunrobin Castle
...	2·50	...	...	·29	14	21	...	9·40	...	...	...	Castletown
4·03	3·07	— ·96	76	1·20	17	21	16·04	7·83	— 8·21	49	58·11	Killarney
2·55	1·09	—1·46	43	·36	16	18	9·91	3·75	— 6·16	38	39·30	Waterford
2·17	2·74	+ ·57	126	·53	15	20	7·34	6·39	— ·95	87	33·47	Hurdlestown
2·38	2·34	— ·04	98	·35	16	19	8·10	5·15	— 2·95	64	35·19	Abbey Leix
1·85	1·93	+ ·08	104	·74	19	19	5·99	3·66	— 2·33	61	27·75	Dublin
2·45	2·93	+ ·48	120	·55	16	24	8·42	(7·53)	— ·89	89	37·04	Ballinasloe
5·67	4·76	— ·91	84	1·70	16	19	19·61	13·05	— 6·56	66	80·23	Kylemore House
3·95	4·84	+ ·89	123	1·22	16	23	12·96	12·07	— ·89	93	50·50	Enniscoe
2·56	3·02	+ ·46	118	·94	16	16	9·16	6·45	— 2·71	70	38·61	Seaforde
3·06	5·24	+2·18	171	1·05	16	24	9·35	12·82	+ 3·47	137	41·20	Londonderry
2·47	4·92	+2·45	199	1·25	16	21	8·30	9·89	+ 1·59	119	37·85	Omagh

† and 19.

SUPPLEMENTARY RAINFALL, MARCH, 1907.

Div.	STATION.	Rain. inches	Div.	STATION.	Rain. inches
II.	Abinger Hall	1·20	XI.	Rhayader, Tyrmynydd	...
,,	Ramsgate, West Cliff Villas	·59	,,	Lake Vyrnwy	3·19
,,	Hailsham	1·07	,,	Llangyhanfal, Plâs Draw	1·61
,,	Crowborough, Uckfield Lodge	1·37	,,	Criccieth, Talarvor	2·17
,,	Osborne, Newbarn Cottage.	·42	,,	Llanberis, Pen-y-pass	...
,,	Emsworth, Redlands	·75	,,	Lligwy	2·41
,,	Alton, Ashdell	1·22	,,	Douglas, Woodville	3·39
,,	Newbury, Welford Park	1·23	XII.	Stoneykirk, Ardwell House	3·41
III.	Harrow Weald, Hill House.	·98	,,	Dalry, The Old Garroch	6·81
,,	Oxford, Magdalen College	·79	,,	Langholm, Drove Road	5·28
,,	Bloxham Grove	·92	,,	Moniaive, Maxwelton House	4·48
,,	Pitsford, Sedgebrook	1·11	XIII.	N. Esk Reservoir [Penicuick]	4·50
,,	Huntingdon, Brampton	1·01	XIV.	Maybole, Knockdon Farm	3·75
,,	Wisbech, Bank House	1·02	XV.	Campbeltown, Witchburn	4·81
IV.	Southend Water Works	·81	,,	Inveraray, Newtown	7·81
,,	Colchester, Lexden	·75	,,	Ballachulish House	8·09
,,	Newport, The Vicarage	·94	,,	Islay, Eallabus	5·34
,,	Rendlesham	·92	XVI.	Dollar Academy	4·22
,,	Swaffham	1·19	,,	Loch Leven Sluice	3·19
,,	Blakeney	1·44	,,	Balquhidder, Stronvar	6·05
V.	Bishops Cannings	·89	,,	Perth, Pitcullen House	1·93
,,	Ashburton, Druid House	1·42	,,	Coupar Angus Station	1·73
,,	Okehampton, Oaklands	1·43	,,	Blair Atholl	2·20
,,	Hartland Abbey	·88	,,	Montrose, Sunnyside Asylum	1·31
,,	Lynmouth, Rock House	1·56	XVII.	Alford, Lynturk Manse	1·24
,,	Probus, Lamellyn	1·00	,,	Keith Station	1·46
,,	Wellington, The Avenue	·74	XVIII.	N. Uist, Lochmaddy	4·24
,,	North Cadbury Rectory	·58	,,	Alvey Manse	2·93
VI.	Clifton, Pembroke Road	1·14	,,	Loch Ness, Drumnadrochit.	2·66
,,	Ross, The Graig	·55	,,	Glencarron Lodge	11·69
,,	Shifnal, Hatton Grange	1·13	,,	Fearn, Lower Pitkerrie	1·15
,,	Cheadle, The Heath House.	1·84	XIX.	Invershin	2·11
,,	Blockley, Upton Wold	1·03	,,	Altnaharra	3·59
,,	Coventry, Kingswood	1·04	,,	Bettyhill	2·20
VII.	Market Overton	1·22	,,	Watten Station	1·46
,,	Market Rasen	1·31	XX.	Dunmanway, The Rectory	2·48
,,	Bawtry, Hesley Hall	·96	,,	Cork	1·13
VIII.	Neston, Hinderton Lodge	1·90	,,	Darrynane Abbey	2·82
,,	Southport, Hesketh Park	2·70	,,	Glenam [Clonmel]	1·59
,,	Chatburn, Middlewood	...	,,	Ballingarry, Gurteen	2·38
,,	Cartmel, Flookburgh	5·16	,,	Miltown Malbay	3·34
IX.	Langsett Moor, Up. Midhope	3·90	XXI.	Gorey, Courtown House	·83
,,	Scarborough, Scalby	·97	,,	Moynalty, Westland	2·95
,,	Ingleby Greenhow	·70	,,	Athlone, Twyford	2·75
,,	Mickleton	2·24	,,	Mullingar, Belvedere	3·26
X.	Bardon Mill, Beltingham	2·73	XXII.	Woodlawn	3·88
,,	Ewesley, Fallowlees	2·14	,,	Westport, Murrisk Abbey	...
,,	Ilderton, Lilburn Cottage	1·40	,,	Collooney, Markree Obsy.	4·82
,,	Keswick, York Bank	6·06	XXIII.	Enniskillen, Portora	4·43
XI.	Llanfrechfa Grange	2·29	,,	Warrenpoint, Summer Hill.	1·80
,,	Treherbert, Tyn-y-waun	4·84	,,	Banbridge, Milltown	2·87
,,	Carmarthen, The Friary	1·83	,,	Belfast, Springfield	4·89
,,	Castle Malgwyn [Llechryd].	1·35	,,	Bushmills, Dundarave	4·54
,,	Plynlimon	7·20	,,	Stewartstown, The Square	3·84
,,	Tall-y-llyn	1·40	,,	Killybegs	6·61
,,	New Radnor, Ednol	1·90	,,	Horn Head	3·91

METEOROLOGICAL NOTES ON MARCH, 1907.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

LONDON, CAMDEN SQUARE.—Remarkably fine, sunny, warm and dry. The last week in particular resembled June rather than March; on each of the last 5 days the shade temp. exceeded 60°, and on the 31st reached 68°·7. Mean temp. 44°·2, or 2°·1 above the average. Duration of sunshine 151·4* hours, and of R 28·0 hours.

CROWBOROUGH.—Brilliant weather throughout, with mean temp. 44°·1 and R ·99 in. below the average of 36 years. On 16 days there was brilliant sunshine all day.

HARTLEY WINTNEY.—A dry month, in which cold winds and slight showers alternated so as to make the conditions seasonable rather than agreeable. From 19th to the end there was fog and frost in the mornings, with cloudless days. Ozone occurred on every day, with a mean of 4·3.

TORQUAY.—Duration of sunshine 201·8* hours, the greatest in March since 1893; 135·4 hours occurred on the last 13 days. Mean temp. 46°·0, or 1°·9 above the average.

CLIFTON.—Dry till 4th, followed by slight R almost daily till 19th, with westerly winds increasing to a gale on 17th and 19th. The remainder was fine, with almost continuous sunshine, high max. temp., but ground frosts at night. R less than half the average.

WORKSOP.—More sunshine than in any of the last 26 years, the max. temp. also being exceeded by 0°·1 only in 1884. The max. temp. was 66°·0 or more on each of the last 5 days. In the previous 31 years this was reached 5 times only in March, and never more than twice in one month.

BOLTON.—Such pleasant climatic conditions had not been experienced for many years. The mean temp. was with little exception above the average throughout, the mean being 42°·1, or 2°·2 above the average. Duration of sunshine 101·4* hours, or 24·3 hours above the average.

SOUTHPORT.—Exceptionally brilliant, and notable for high max. temp., reaching 67°·6 on 31st, the highest since 1884. Mean temp. 43°·4, or 1°·7 above the average. Duration of sunshine 178* hours, or 53 hours above the average. R ·53 in. above the average; duration, 56·3 hours.

HAVERFORDWEST.—Fine and cold, with small R and sharp frosts. Duration of sunshine 167·6* hours. Gale on 16th; velocity at Goodwick 80 miles per hour.

DOUGLAS.—The first week was fine and mild, succeeded by a fortnight of the worst March weather, stormy, wet and cold. Violent N.W. gale from 16th to 20th. The remainder was unusually fine and calm, with cold nights.

GLASGOW.—The first 4 days were fine but cold; then till 20th cold, stormy and wet, with S showers. From 20th was dry, clear and warm, the max. temp. reaching 50° each day.

COUPAR ANGUS.—An ideal month, particularly in the last week, when the temp. reached 60° on several days. Mean temp. 42°·1, or 3°·0 above the average.

LYNTURK.—The weather of the first half was of the same type as in January and February, S with short open intervals. The last 10 days were very fine.

DRUMNADROCHIT.—R ·35 in., and rain days 1, below the average of 21 years.

CASTLETOWN.—The first few days were fine, but from 5th to 21st rough and cold, with S, keeping back ploughing. The latter part was fine, dry and sunny.

CORK.—R 1·54 in. below the average, making a deficit of 6·24 in. in the past three months. Mean temp. 2°·2 above the average.

DUBLIN.—A showery month with a stormy period from 13th to 20th. From 20th anticyclonic conditions prevailed. Mean temp. 46°·5. Aurora on 21st.

MARKREE.—Much H, sleet and S, with heavy R, in the first half. On 16th 1·47 in. fell in 5 hours between noon and 8 p.m. There was much sunshine.

BELFAST.—Severe weather, except towards the end, and R nearly 2·00 in. above the average.

* Campbell-Stokes.

Climatological Table for the British Empire, October, 1906.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Max. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	71·0	1	35·4	26	61·5	47·6	50·4	88	109·5	34·4	3·15	17	...
Malta	81·7	15	58·1	29	75·0	66·4	62·4	84	...	52·9	8·57	11	3·5
Lagos	85·0	sevl	69·0	14	84·0	73·6	73·1	79	162·0	68·0	6·91	14	6·9
Cape Town	87·5	31	41·9	23	68·3	51·6	50·1	68	...	...	1·29	9	3·3
Durban, Natal ...	84·9	21	53·3	5,6	75·2	60·1	...	...	141·6	...	7·33	19	6·0
Johannesburg	83·5	30	41·2	5	68·9	49·2	45·8	72	152·3	39·2	4·97	11	2·0
Mauritius	83·6	12	61·1	31	78·8	64·9	62·1	73	147·7	52·0	2·01	19	7·4
Calcutta...	91·7	4, 5	67·6	25	87·3	74·2	73·9	81	155·3	62·6	5·50	6	5·3
Bombay...	94·0	23	72·2	30	89·0	76·4	73·1	76	141·9	63·4	·00	0	2·1
Madras	94·6	12	69·2	28	89·7	75·8	73·3	79	147·6	67·7	4·15	9	4·7
Kodaikanal	67·2	10	47·1	31	62·6	51·6	52·5	89	144·0	38·3	7·00	26	7·1
Colombo, Ceylon ...	87·6	15	73·2	28	84·9	75·3	73·6	86	155·2	71·2	15·80	27	7·9
Hongkong	88·9	2	65·7	23	81·0	71·1	62·1	62	141·7	...	1·32	3	4·5
Melbourne	83·8	28	37·8	9	65·7	48·5	47·2	73	149·8	32·4	2·93	12	6·6
Adelaide	95·0	27	42·0	31	71·2	50·6	48·0	63	149·3	37·6	1·66	12	4·4
Coolgardie	98·6	20	39·0	2	78·7	50·9	41·9	43	164·0	36·8	·00	0	2·8
Sydney	92·8	30	46·9	6	73·5	56·5	49·8	59	131·2	41·1	2·06	17	3·9
Wellington	65·2	28	39·6	5	59·9	49·2	45·2	70	132·0	31·0	·71	7	4·5
Auckland	69·0	30	42·0	2	63·2	51·2	47·5	70	130·0	36·0	·97	9	4·9
Jamaica, Negril Point.	88·8	26	69·6	25	86·4	73·3	73·5	79	...	...	9·33	15	...
Trinidad	91·0	23	67·0	21*a*	87·9	70·7	73·7	83	157·0	67·0	6·80	15	...
Grenada	90·4	27	70·6	9	84·4	74·2	78·8	80	155·0	...	14·20	19	4·2
Toronto	73·0	5	26·4	31	56·9	41·3	43·9	81	104·5	20·2	4·49	13	5·9
Winnipeg	72·0	3	5·8	30	52·7	30·8	...	...	...	...	·21	3	6·2
St. John's, N.B. ...	63·6	10	34·4	13	55·8	42·1	...	...	...	...	3·13	11	4·8
Victoria, B.C.	69·8	9	34·0	21	57·4	46·7	...	...	...	...	5·60	18	6·5
Dawson	...	...	...	...	...	...	...	...	...	...	...	...	...

a and 23.

MALTA.—Mean temp. 68°·7, or 0°·5 below the average. Mean hourly velocity of wind 7·4 miles, or 1·5 below average. Mean temp. of sea 72°·8.

Johannesburg.—Rainfall 242 per cent. of average. TSS with H were frequent in the early part of month.

Mauritius.—Mean temp. of air 0°·9 below, dew point 0°·3, humidity 3·1 per cent., and R ·42 in. above, averages. Mean hourly velocity of wind 9·7 miles, or 1·3 below average.

MADRAS.—R less than half the average.

KODAIKANAL.—Bright sunshine 112 hours.

COLOMBO.—Mean temp. of air 79°·2, or 0°·9 below, of dew point 0°·6 above, R 1·10 in. above, averages. Mean hourly velocity of wind 8·0 miles. TSS on 5 days.

HONGKONG.—Mean temp. of air 75°·6. Bright sunshine 233·4 hours. R 3·4 in. below average. Mean hourly velocity of wind 11·5 miles.

Adelaide.—Mean temp. of air 1°·1 below, and R ·10 in. below, averages.

Sydney.—Mean temp. of air 1°·6 above, and R ·88 in. below, averages.

Wellington.—Mean temp. of air 0°·2 above, and R 3·61 in. below, averages.

TRINIDAD.—R ·15 in. above 43 years' average.